e-lab control panel instructions

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The unit is shipped with one 1:1 probe. Do not try to measure voltages higher than 25 volts peak with this probe.

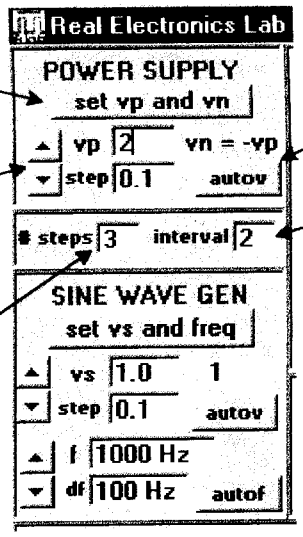
Win 95/98 Advanced All in One Operating Panel with Auto Data Log

How to use the Power Supplies

Click to output the voltage entered next to vp (in this case 2v)

Click on these up and down arrows to quickly increase or decrease vp (and vn) by the step value entered

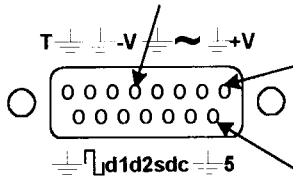
Number of steps for all auto data taking operations described on the right.



Clicking here will initiate automatic incrementing and data taking operation where vp (vn will track) will start at 2 and increment by 0.1v steps for 3 steps to 2.3v according to the entered numbers currently shown on the panel

Delay interval in seconds between data increments.

vn, negative output terminal.
vn will track vp under normal operating conditions not exceeding current limits



vp output terminal
0 - 8v to 200ma

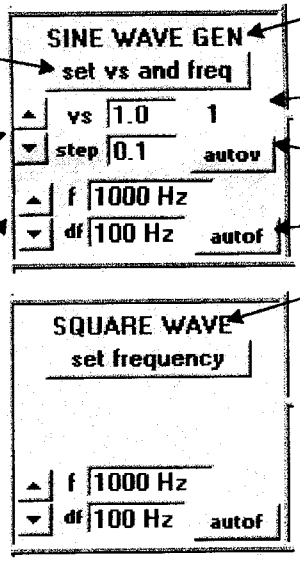
Not controlled by panel.
Constant 5v out up to 500ma

How to use the Signal Generators

Click to output both vs and f entered in the textboxes, in this case, 1v peak at 1000Hz

Click on these up and down arrows to quickly increase or decrease vs only (f remains constant) by the step value entered

Click on these up and down arrows to quickly increase or decrease f only (vs remains constant) by the step value df entered



Double click on the title to reveal the square wave freqency setting panel shown below.

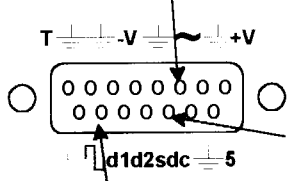
Display of approx. amplitude falloff at very high frequencies.

Auto data taking for vs only, f remains constant.

Auto data taking for f only, vs remains constant.

Double click on the title to restore the sine wave freqency setting panel.

ac sine wave out, (dc sine wave passed thru a 5uf capacitor.)

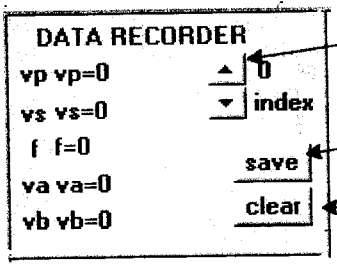


dc sine wave out, nominally from 0 to 2vs

square wave out from 0 to 5v.
Note this terminal is shared with the d3 data bit. If d3 is selected, the square wave will not be available.

Data logging panel

For all auto data functions, 5 items of data is recorded for each data step. va represents a measurement taken by channel A and vb by channel B. The user must set up channels A and B properly before initiating auto data functions

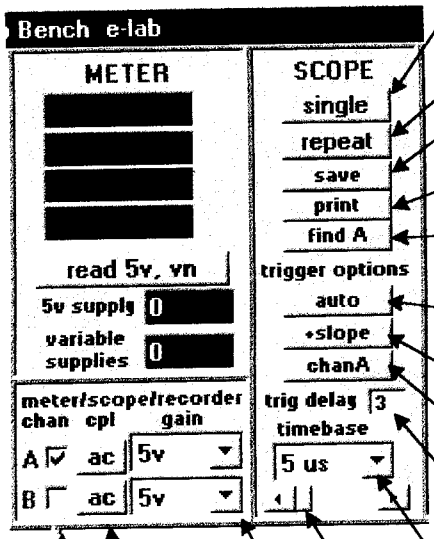


Click on these up and down arrows to examine the logged data table.

Save the data table to disk.

Clear the data table.

How to use the Oscilloscope



Click here to take and display 100 samples of the selected channel or channels at the chosen gain and timebase settings.

Click here to repeatedly take and display 100 samples.

Save to disk the data points of the currently displayed waveforms.

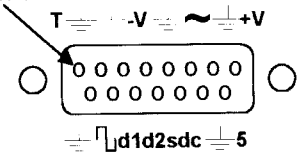
Click here to print the currently displayed waveforms.

Click here to automatically find and display an unknown periodic waveform.

auto trigger selection will use software trigger to begin data recording process if a hardware trigger is not detected within 1 second.

start display of channel A with either positive or negative slope

trigger source, channel A or external on pin 8



maximum wait time for a trigger signal when manual triggering is selected.

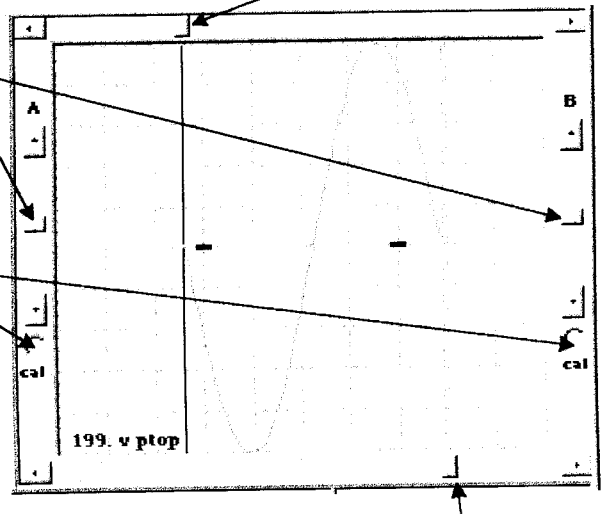
Click here to drop down the timebase options. Click the mouse on the desired timebase to select.

Click to select ac or dc coupling for channels A or B.

Drag this button to the right to display additional points of the displayed waveform.

Scope will display checked channels.

Dropdown and select gain options for channels A and B. Operates in similar fashion to timebase dropdown.

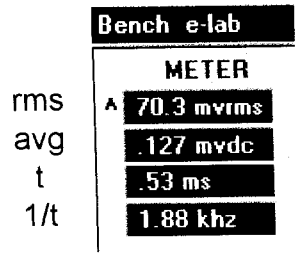


Drag these vertical position buttons to move the waveforms up or down in the display.

Click here to restore the display to their original vertical positions.

Right time marker

Mathematical analysis will automatically be carried out on the waveform segment enclosed between the left and right time markers. The computer will calculate the time and inverse of the time between the 2 markers. It will also calculate the average and rms values of the enclosed segment. These answers are displayed in the meter area



NOTE: Do not try to observe signals with another scope hooked up to the same point as the e-LAB scope or distortion will occur. Use the external scope alone or the e-LAB scope alone on any single test point.

How to use the Chart Recorder

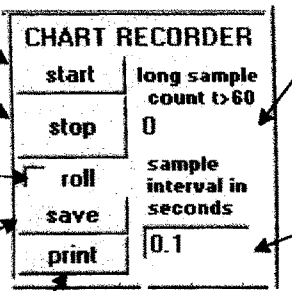
Click here to start the recorder which will record up to 32000 points at the interval entered.

Click here to stop the recording process.

If this box is checked, the recorded data will be displayed like a moving roll of paper. This display method will work properly only with sample intervals longer than 0.1 seconds depending upon the speed of your computer.

Click here to save the data points of the last start, stop interval

Cick here to print what is currently displayed on the recorder panel.

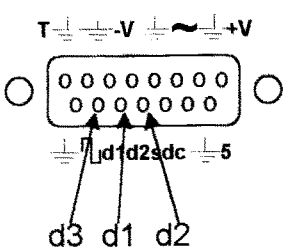


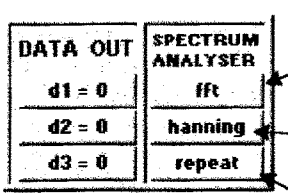
For sample intervals longer than 60 seconds, this box will display the total number of samples taken as long as the recorder is still running.

Enter the sample interval in this box. Sample intervals up to 0.01 seconds will work properly only on very fast computers in single channel mode. To minimize errors, do not move the mouse or initiate or have any background activity on the computer during the record session..

When chart recorder is selected, channel A and B coupling is automatically switched to dc for slow signals. In dual channel operation the gain range is checked to make sure they are in the same relay range. Since data is multiplexed in real time, the gain relay does not have time to switch in dual channel operation. Also dual channel operation is advised only on sampling intervals 0.1 seconds and longer.

Spectrum Analyser and Data Bits





After acquiring a scope display, the frequency spectrum of that waveform is shown by clicking this button

The fft can be calculated based on either a hanning or flattop envelop selected by this button.

Selecting repeat will cause the fft to be updated repeatedly from the channel A input.

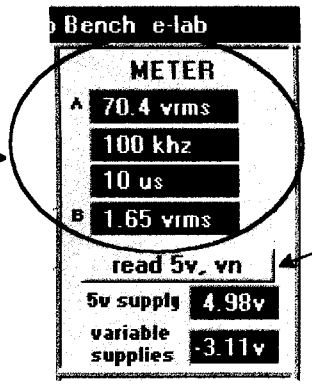
Clicking on these buttons will toggle the respective outputs shown above to be approx. 0v or 5v depending upon load.

Note, the d3 pin is shared with the square wave output. If square wave output is selected (see signal gen. instructions) then d3 will not be available.

With customizing source code, the data bit outputs can be used as control signals in a feedback control system where the scope inputs can acquire the feedback signals.

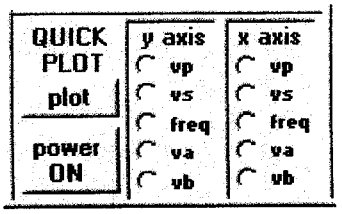
Digital Meter Operation

This part of the meter operates automatically. Dc or ac calculations are determined by the coupling mode selected. AC calculations assume a sine wave. DC calculations assume true dc. For other ac or dc waveshapes, use the left and right time markers (see scope instructions for details) to determine the true rms and dc values.
Frequency readings will appear only for ac coupled signals on channel A where the displayed waveform peak to peak is at least 6 divisions.



Clicking on this button will disconnect and disable the scope channels and reconnect the lines internally to the 5v power supply and vn output of the box.
It will continuously read those 2 outputs untils the button is reclicked to reenable the scope lines.
Note vn is dependent upon and tracks vp. Therefore a good reading on vn assures an equal reading on vp.

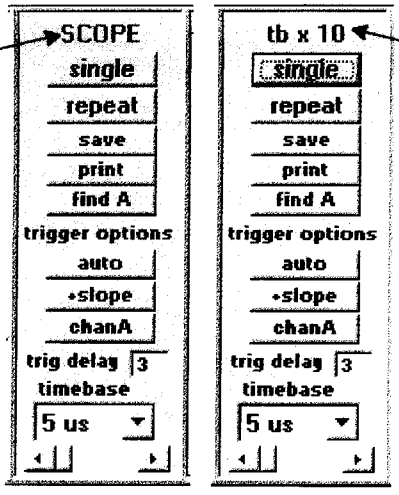
Other Panel Features



Once data is acquired by any automated data process (see data logging instructions), you can select any data variable as y and another as x and perform a quick autoscaling plot of the raw data to see their relationship.

The power ON button can quickly turn off the vn, vp and vs signals during circuit hookup or in a circuit emergency.

Double clicking on this title will change the scope display from 100 points to 1000 points. It will also change the title to tbx10 as shown. Therefore on the new wide display, the timebase will really be 50us per division for the sample shown here. All scope operations will work except due to the extra points, much slower updates will result.



Double clicking on this title will restore normal scope operation.

Note, the data acquisition device built into the box is capable of acquiring and storing a continuous data stream of 32,000 bytes in the scopemode..

For those who find use for this long single shot data record, it is advised that they examine the data routine source code to customize their own applications.

Easy to Use 16Bit Win3.X or 95/98 Control Panels

Install and use this control panel if you have Win3.1 or if you want an easier to use panel with larger display and don't need the automated data features of the Win95/98 integrated control panel. This panel is similar to the popular panel used in the earlier multiscope 1 and 2 versions. See Win 95 detailed instructions for explanation of scope control button operations

Check this box to convert d3 to square wave output. Frequency can be entered in new textbox. Click new clock button to send out

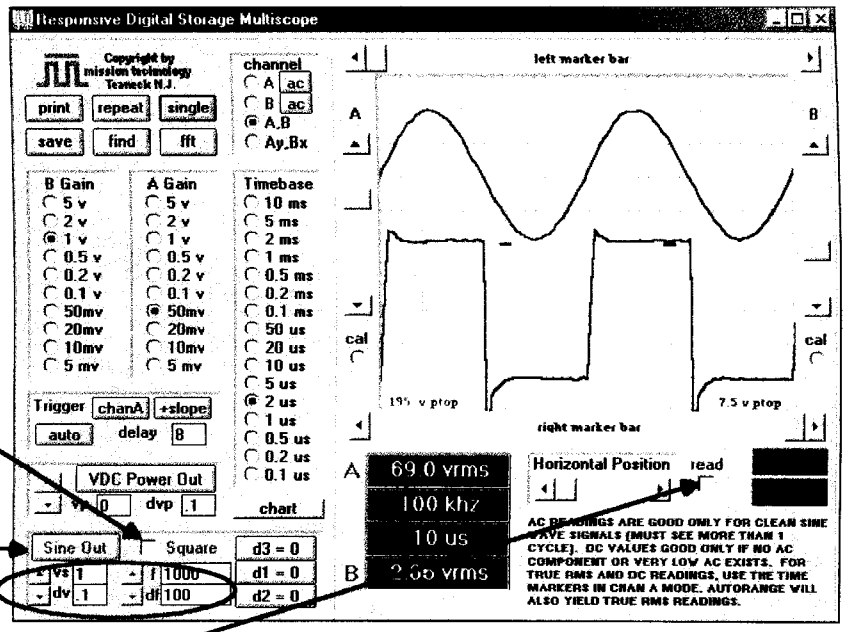
Click this button if values for frequency and amplitude are entered from the keyboard

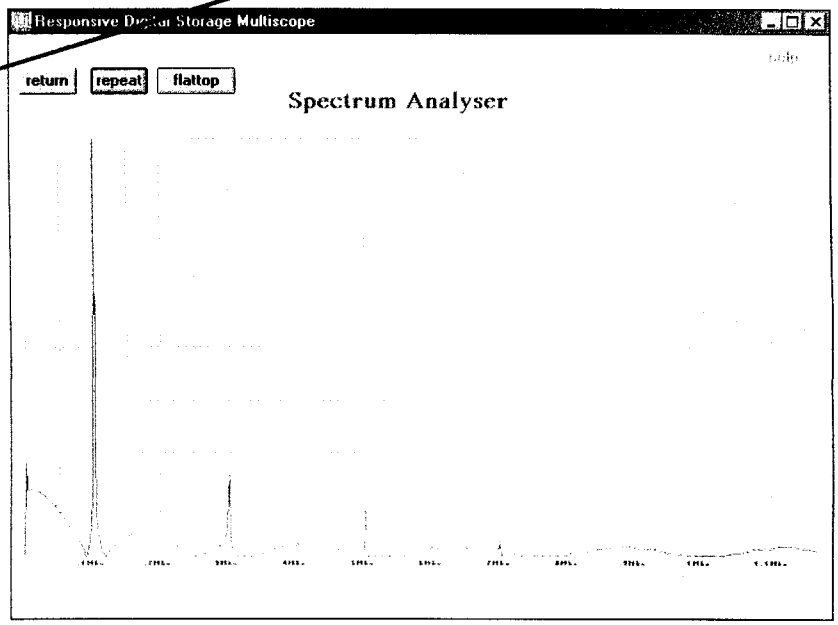
Sine wave amplitude and frequency control

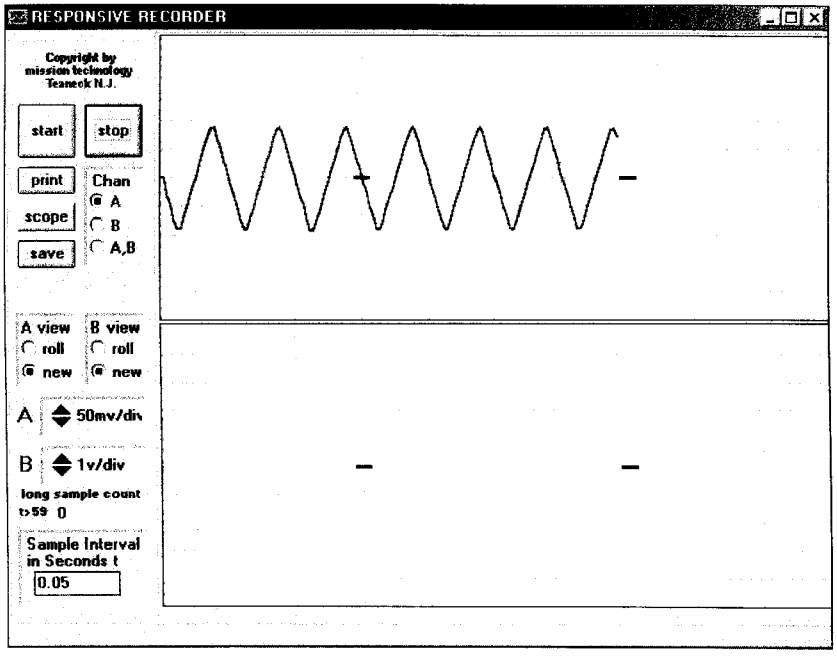
Check this box to read the power supply output. You must uncheck this box to reenable scope operation.

The spectrum analyser is started by clicking on the fft button on the scope panel.

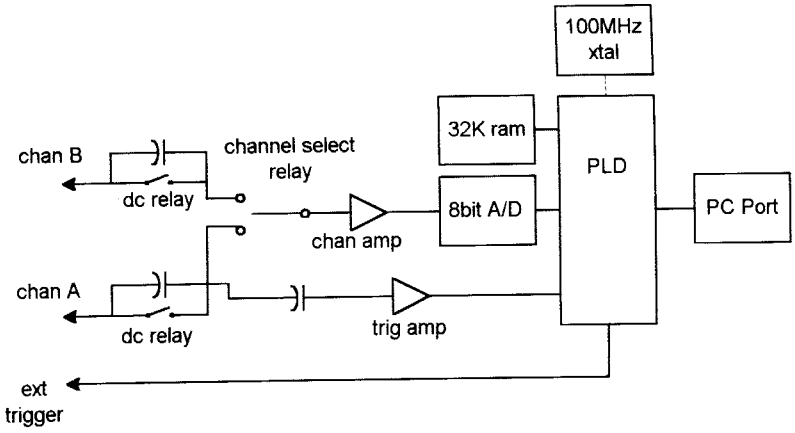
The recorder panel appears when the chart button is clicked on the scope panel. Except for the spin buttons used to select the gains, its operation is similar to the description provided in the Win9X instructions. Click on scope to return to scope panel.







Scope Operation Diagram



Some Notes on Operation

1. A/D is rated at 50Mhz but can be clocked to 100 with some additional noise.
2. 100MHz clock is divided down to 1KHz in 2, 5,10 sequence in 16 steps.
3. **Since ext trigger goes directly to PLD, make sure you do not exceed 5v logic or chip will be damaged.**
4. In scope mode, only 1K of ram is used in the interest of faster update speeds. 32K is available in the Wideview operating panel.
5. In the regular scope window, exactly 100 points is displayed or 10 per division. Additional points are available either with the horizontal scroll bar or the option to see all 1000 points (see instructions)
6. Recorder mode uses same circuit except A/D data is read point by point directly into the PC instead of the in box ram.
7. 600 points is used in the fft calculation.
8. An OCX control is available free to purchasers of 6 units or more. The regular price of the control is $200 . The control permits easy programming of all aspects of the instrument including scope, signal generators and power supply. You can program much more accurate ffts using up to 32K points.
9. There are 2 potentiometers inside the box. The rear most pot. is used to adjust the zero level on the 5v/div range. The nearer pot is used to adjust the zero level in the 20mv/div range. Some back and forth zeroing may be necessary to achieve optimum results. In normal operation, original factory adjustments should be adequate for most measurements.
10. **The unit is shipped with one 1:1 probe. Do not try to measure voltages higher than 25 volts peak with this probe.**